

STUDIES ON AUSTRALIAN MARINE ALGAE. III.

GEOGRAPHICAL RECORDS OF VARIOUS SPECIES AND OBSERVATIONS ON ACROCHAETIUM
BOTRYOCARPUM (HARV.) J. AG. AND PTEROCLADIA CAPILLACEA (GMEL.) BORN. AND THUR.

By VALERIE MAY, M.Sc. (C.S.I.R., Marine Biological Laboratory, Cronulla, N.S.W.*)

(Plate xix.)

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GEOGRAPHICAL RECORDS.

Part ii of this series of studies (May, 1946) records the occurrence in Australia of certain algae and extends the known range here of other species. Similar observations on other species are recorded below. The specimens quoted are located either in my own herbarium (quoted as VM) or in the National Herbarium of New South Wales (quoted as NSW).

MELANOPHYCEAE.

PETROSPONGIUM RUGOSUM (Okamura) S. & G.

New Record for Australia.

This identification is based on the description and illustration given by Setchell and Gardner (1925). This species is known previously from both Japan and California, U.S.A., but the present is the first record of the genus occurring in Australia. Here, as elsewhere, *Petrospongium rugosum* occurs in the littoral zone, adhering to rocks which are exposed to surf between tides.

The zoosporangia are described by Setchell and Gardner (p. 509) as "attached laterally a little below the middle"; their illustration (Plate 39, fig. 42) shows this mode of attachment in mature zoosporangia, while in young stages the attachment is shown as basal. In the Australian material examined, full-size zoosporangia are attached either basally or laterally.

Locality.	Date.	Herbarium.	Notes.
Newport, near Sydney, N.S.W. . . .	x.1944.	VM No. 429.	
Long Reef, near Sydney, N.S.W. . . .	x.1944.	VM No. 162.	
Long Reef, near Sydney, N.S.W. . . .	xi.1944.	VM No. 430.	
Bilgola, near Sydney, N.S.W.	xi.1945.	VM Nos. 921, 922.	
Malabar, near Sydney, N.S.W.	vii.1945.	VM No. 843.	
Coogee, near Sydney, N.S.W.	x.1914.	NSW	Collected by A. H. S. Lucas, previously labelled <i>Peysson-</i> <i>nelia</i> sp.

PACHYDICTYON PANICULATUM J. Ag.

New Record for New South Wales.

This species is known from the southern coast of Australia, but the present are the first records of it from New South Wales.

Locality.	Date.	Herbarium.
Moruya, S. Head Beach	7.i.1943.	VM No. 985.
Warden's Head, Ulladulla	13.i.1946.	VM No. 2040.

* Contribution No. 60 from the Laboratory.

SPATHOGLOSSUM CORNIGERUM J. Ag.

New Record for Queensland.

This species is known from New South Wales as far north as Port Stephens, and is now recorded from Queensland.

Locality.	Date.	Herbarium.	Notes.
Margate, Moreton Bay, Qd.	xii.1943.	VM No. 984.	Drift.

DICTYOPTERIS PARDALIS (Harv.), n. comb.

New Record for Eastern Australia.

This species was described (Harvey, 1855, p. 535), figured (Harvey, 1863, Pl. 29) and distributed (Harvey's Alg. Aust. Exsicc., No. 86) as *Haliseris pardalis*. Setchell and Gardner (1925, p. 656) give reason for the adoption of the generic name *Neurocarpus* Web. and Mohr. in preference to the name *Haliseris* Targ.-Tozz. ex Ag., and this is the procedure I have adopted previously with this genus. However, the latest Congress on International Rules has again listed *Dictyopteris* as "nomina conservanda proposita" in preference to *Neurocarpus*, so that I now adopt this generic name and *H. pardalis* now becomes *D. pardalis*.

Previously *D. pardalis* was known only from Western Australia (Geraldton to Broome); the present record from Queensland suggests that this species may occur along the north Australian coast, of which the algae have been as yet but little examined.

Lucas (1935) compared *H. pardalis* with *H. crassinervia* Zan. from Lord Howe Island. The two species appear to be very alike, and they may yet prove to be the same.

Locality.	Date.	Herbarium.	Notes.
Margate, Moreton Bay, Qd.	xii.1943.	VM No. 991.	Drift.

RHODOPHYCEAE.

BANGIA FUSCOPURPUREA (Dillw.) Lyngb.

New Record for New South Wales.

The identification of this species is based upon comparison with the illustration and description given by Okamura (1921). *B. fuscopurpurea* is known in the Pacific from California, U.S.A., as well as Japan, but the present appears to be the first record of it from Australia other than a passing reference by Laing (1928). It seems that in Australia this species has previously been recorded as *B. atropurpurea* viz., by Lucas, who recorded that species from Tasmania (1913) and New South Wales (1914). *B. fuscopurpurea* appears to be the salt-water counterpart of the fresh-water *B. atropurpurea*. Local New South Wales records definitely refer to marine algae, and the Tasmanian location given (Blackman's Bay, Derwent River) is almost certainly a salt-water collection, too. I have examined Lucas' material (Herb. NSW) and see no difference whereby it could be distinguished from *B. fuscopurpurea*. Thus his records appear to refer to *Bangia fuscopurpurea*, and are cited below as such, together with additional collections made by the writer.

Locality.	Date.	Herbarium.	Notes.
R. Derwent, Tasm.	vi.1909.	NSW	Collected by L. Rodway.
R. Derwent, Tasm.	viii.1909.	NSW	Collected Estuary by L. Rodway.
Bondi, near Sydney, N.S.W.	iii.1910.	NSW	Collected by A. H. S. Lucas.
Coogee, near Sydney, N.S.W.	x.1914.	NSW	Collected by A. H. S. Lucas.
Wattamolla, near Sydney, N.S.W.	viii.1944.	VM No. 215.	In rock pools.
Collaroy, near Sydney, N.S.W.	x.1944.	VM No. 150.	On horizontal concrete above rock
Corrimal Headland, near Sydney, N.S.W.	iii.1945.	VM No. 647.	baths.

Locality.	Date.	Herbarium.	Notes.
Narrabeen Headland, near Sydney, N.S.W.	v.1945.	VM No. 745.	Far out rocks.
Curl Curl, near Sydney, N.S.W. . .	xii.1945.	VM No. 1161.	On dry rock low-tide level.
Narrabeen Lake, near Sydney, N.S.W.	vii.1946.	VM No. 2098.	Riptide region.
Kiama, N.S.W.	vi.1945.	VM No. 821.	On far out rock exposed at low tide.

CHAMPIA COMPRESSA Harv.

New Record for New South Wales.

This species was originally described from South African material, and was later recorded by Harvey (1863) as occurring in Australia, both in Western Australia and Victoria.

Material from New South Wales now referred to *C. compressa* appears to agree with Harvey's description and illustration (1847, p. 78, Pl. 30) and occurs in small quantities with moderate frequency on headlands in rock pools exposed at low tide. The growing plant is vivid blue and iridescent and so is easily located.

C. compressa resembles *C. Laingii* Lind. from New Zealand, since it has a compressed and iridescent thallus. The New Zealand species, however, is larger and more dorso-ventral than the Australian one.

Locality.	Date.	Herbarium.	Notes.
Mona Vale, near Sydney, N.S.W. . .	11.iii.1945.	VM No. 523.	Tetrasporic.
Malabar, near Sydney, N.S.W. . . .	7.vii.1945.	VM No. 845.	
Mona Vale, near Sydney, N.S.W. . .	29.iii.1946.	VM No. 2047.	Tetrasporic.
Mona Vale, near Sydney, N.S.W. . .	29.iii.1946.	VM No. 2048.	Cystocarpic.
Mona Vale, near Sydney, N.S.W. . .	29.iii.1946.	VM Nos. 2049-52.	
The Entrance, Lake Illawarra, N.S.W.	25.iii.1945.	VM No. 641.	Tetrasporic.
Green Island, Entrance to Lake Conjola, N.S.W.	3.v.1946.	VM No. 2068.	

SPECIES EXCLUDENDAE.

Bangia atropurpurea (Roth) Ag. from Tasmania and New South Wales. Discussed above under *B. fuscopurpurea*.

COLLECTIONS FROM NORTH-WEST AUSTRALIA.

The three species listed below were collected by G. P. Whitley while on the "Isobel" Fisheries Survey of north-west Australia. The marine flora of this area is very inadequately known, so that this small collection is therefore welcome and worthy of record.

TURBINARIA ORNATA J. Ag.

Locality.	Date.	Herbarium.	Notes.
Long Island, near the Dampier Archipelago, W. Aust.	1.xi.1945.	VM No. 2085.	This specimen agrees with that illustrated in Turner (1808, p. 50, Pl. 24, figs. c-h). The species is known previously from north and north-east Australia, also from Ceylon, the Andaman Islands, etc.

CYSTOPHYLLUM prob. MURICATUM (Turn.) J. Ag.

Locality.	Date.	Herbarium.	Notes.
Long Island, near the Dampier Archipelago, W. Aust.	1.xi.1945.	VM No. 2086.	Very small scraps (with vesicles) were included with the above quoted <i>Turbinaria</i> collection. This species occurs in estuarine waters of most of Australia.

NODULARIA prob. SPUMIGENA Mert.

Locality.	Date.	Herbarium.	Notes.
Floating 25 m. east of Bedout I., W. Aust.	23.x.1945.	VM No. 2087.	This genus occurs widely in ocean surface collections.

OBSERVATIONS ON ACROCHAETIUM BOTRYOCARPUM (Harv.) J. Ag.

Papenfuss (1945) recently reviewed the *Acrochaetium*-*Rhodochorton* complex; on page 313 of this work he discusses *A. botryocarpum*, and queries the accuracy of Harvey's report that tetraspores are produced in this species. In order to check this detail the present writer examined Harvey's Alg. Aust. Exsicc. No. 523 labelled *Callithamnion botryocarpum*, from King George's Sound, Western Australia (Herb. NSW). This specimen shows monospores copiously developed in clusters, but there are no tetraspores. Harvey's material thus agrees with that illustrated by Hamel (1928, fig. 42), and the present finding supports Papenfuss' and Hamel's contention that Harvey's description in this case was inaccurate. These observations eliminate the only probable instance of an alternation of generations among the known species of *Acrochaetium*.

CYSTOCARPS OF PTEROCLADIA CAPILLACEA (Gmel.) Born. and Thur.

In Australian collections of *Pterocladia capillacea* there appears to have been a remarkable absence of cystocarpic material.

A. H. S. Lucas worked for many years on Australian algae and reported (quoted by A. and E. S. Gepp, 1906): "I have never been able to get cystocarps, though I have examined great numbers of specimens at all seasons." A. and E. S. Gepp (1906) record further that a specimen collected by J. Bracebridge Wilson at Port Phillip Heads (Victoria) in 1890 was likely to be "the only fruiting specimen from Australia".

The present writer, however, has found cystocarpic material in moderate abundance. These cystocarpic plants were growing in near proximity to others which were either sterile or which bore tetraspores. On each occasion, however, the plants bearing cystocarps were growing in regions very much more shaded than those occupied by other specimens of the species. Thus the occurrence of cystocarp-bearing plants of the species appears to be dependent on ecological factors.

Plate xix, figure 1, shows a shaded rock pool in which cystocarpic plants were growing under the rock ledge indicated. Plate xix, figure 2, shows large areas of sterile specimens growing in exposed sunny areas. This latter is the more usual habitat for the species.

Collections of cystocarpic plants of *Pterocladia capillacea* are listed below.

Locality.	Date.	Herbarium.
Stanwell Park, N.S.W.	26.iii.1945.	VM No. 652.
Fairy Bower, near Sydney, N.S.W.	28.iv.1945.	VM No. 700.
Northern Head, Manly, near Sydney, N.S.W.	5.v.1945.	VM Nos. 737,
Careel Head, Whale Beach, near Sydney, N.S.W.	1.i.1946.	739. VM No. 1190.

SUMMARY.

Petrospongium rugosum is recorded for the first time from Australia. The occurrence is recorded for the first time of three algal species from New South Wales, one from eastern Australia and another from Queensland. A small collection of algae from north-west Australia is recorded.

Bangia atropurpurea is excluded from the list of marine algae of Australia.

Observations on *Acrochaetium botryocarpum* show the presence of monospores, not tetraspores, as had been originally recorded.

The occurrence of cystocarpic plants of *Pterocladia capillacea* in Australia is shown to be dependent on ecological factors.

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EXPLANATION OF PLATE XIX.

Fig. 1.—Shaded rock pool in which cystocarpic plants of *Pterocladia capillacea* were growing.

Fig. 2.—*Pterocladia capillacea* growing in its usual habitat on exposed rocks near low-tide level.